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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,870	01/13/2006	Marc Uwe Tornow	052275	2261

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EXAMINER

GOODWIN, DAVID J

ART UNIT	PAPER NUMBER
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2818

MAIL DATE	DELIVERY MODE
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08/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,870	TORNOW ET AL.	
	Examiner	Art Unit	
	David Goodwin	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/11/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. The applicant claims that the device "may" consist of molecules.
4. This does not distinguish the device from one that "may not" consist of said molecules.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 through 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krahne ("FABRICATION OF NANOSCALE GAPS IN INTEGRATED CIRCUITS" APPLIED

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PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 81, no. 4, 22 July 2002 (2002-07-22), pages 730-732, XP001130351) in view of Lieber (US 7,129,554).

3. Regarding claim 1.

4. Krahne teaches a method of making a semiconductor device. Said device comprises a patterned semiconductor hetero structure forming a source drain and gate contacts to build up a hybrid device from the semiconductor base structure (fig 1e). The device further comprises a wire connecting the source and drain electrodes. Said devices comprises single electron transistors (fig 1f).

5. Krahne does not teach that the wire is organic.

6. Lieber teaches a semiconductor device comprising a single electron transistor (fig 16a, b) (column 21 lines 35-65). Said device comprises a nanowire, said nanowire comprises a carbon nanotube (column 4 lines 55-65, column 9 lines 25-40).

7. It would have been obvious to one of ordinary skill in the art to make the channel of the single electron transistor out of a carbon nanotube nanowire because nanowires are ideally suited for the transport of charge carriers (column 1 lines 30-35).

8. Regarding claim 2.

9. Lieber teaches that said nanowire is a carbon nanotube (column 4 lines 55-65).

10. Regarding claim 3.

11. Lieber teaches that said device comprises a sensor (fig 16c) (column 22 lines 5-15).

12. Lieber teaches that said sensor comprises funtionalising the nanowire (column 18 lines 40-60).

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13. It would have been obvious to one of ordinary skill in the art to functionalize the nanotube so that a specific moiety can be sensed.

14. Regarding claim 4.

15. Lieber teaches that the sensor has receptors that sense proteins or antibodies. (column 6 lines 1-15).

16. It would have been obvious to one of ordinary skill in the art to have receptors that sense antibodies or proteins because antibodies and proteins are known in the art to be of interest and able to make detectable changes.

17. Regarding claim 5.

18. Krahne teaches a semiconductor device. Said device comprises a semiconductor heterostructure which consists of a material stack of two thick undoped layers of material (paragraph 3) separated by a thin doped layer of different thin semiconductor material (fig 1e) with conductive source and drain electrodes on top of the material which are separated by a short groove (fig 1e,f) (paragraph 3).

19. Regarding claim 6.

20. Krahne teaches that the thin etched layer functions as a gate electrode (fig 1e).

21. Regarding claim 7.

22. The limitations of claim 7 are claimed in the alternative therefore Krahne in view of Lieber teaches the device above.

23. Krahne further teaches that the bridging wire exceeds the length of the gap and is terminated (fig 1e).

24. Regarding claim 8.

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25. Lieber teaches that the analate bindstoo the receptor changing the molecular conductance (fig 16d) (column 22 lines 5-20).
26. Regarding claim 9.
27. Krahne teaches that the heterostructure material stack comprises undoped AlGaAs for the thick layers and doped GaAs for the thin middle layer (fig 1e) (paragraph 3).
28. Regarding claim 10.
29. Krahne teaches the deposited metal is a Pd, Au alloy (paragraph 3).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Goodwin whose telephone number is (571)272-8451. The examiner can normally be reached on Monday through Friday, 9:00am through 5:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571)272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DJG

STEVEN LOKE
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Steven Loke", is written below the printed name and title.